WHAT IS CLAIMED IS:

1. A self-learning vehicle control system, the control system comprising:

a processor executing a vehicle model neural network, wherein the vehicle model neural network is a recurrent neural network and the processor is configured to receive one or more of the following inputs:

one or more vehicle control commands; and

one or more vehicle status attributes, the one or more vehicle status attributes comprising one or more sequences of states of a vehicle;

one or more vehicle status sensors communicably connected with the processor; and

an output device communicably connected with the processor and for providing a requested speed and/or acceleration commands; ~~profile~~

wherein the speed control module is configured to generate vehicle control commands in response to receipt of one or more of a vehicle status attribute, a predefined speed profile, or a guideway attribute and the vehicle module is configured to receive the vehicle control commands and generate vehicle status attributes, the speed control module is configured to receive the generated vehicle status attributes.

2. The self-learning vehicle control system of claim 1, wherein the one or more vehicle control commands comprise one or more of:

an actual propulsion effort command;

an actual braking effort command;

an actual steering effort command;

a requested speed command;

a change in a requested speed command;

a requested acceleration command;

a change in a requested acceleration command;

a requested steering command; or

a change in a requested steering command.

3. The self-learning vehicle control system of claim 1, wherein the one or more vehicle status attributes comprise one or more of:

a measured vehicle location;

a measured vehicle speed;

a measured vehicle acceleration; or

a measured vehicle angular speed.

4. The self-learning vehicle control system of claim 1, wherein the one or more vehicle status attributes is sampled at a predefined sampling rate of two times the input rate of the vehicle control system.

5. The self-learning vehicle control system of claim 1, wherein the one or more vehicle status sensors comprises one or more of:

one or more speed determination sensors communicably connected with the controller;

one or more acceleration determination sensors communicably connected with the controller; or

one or more angular speed determination sensors communicably connected with the controller.

6. The self-learning vehicle control system of claim 1, wherein the vehicle model neural network is configured to determine one or more vehicle control loop properties based on the one or more vehicle control commands and the one or more vehicle status attributes.

7. The self-learning vehicle control system of claim 6, wherein the vehicle control loop properties include one or more of a vehicle response time, a vehicle lag, a vehicle frequency, or a vehicle amplitude response with respect to the one or more vehicle control commands.

8. The self-learning vehicle control system of claim 1, wherein the requested speed profile causes execution of a majority of a range of one or more vehicle control commands.

9. The self-learning vehicle control system of claim 1, wherein the requested speed profile causes execution of at least 75% of a range of one or more vehicle control commands.

10. The self-learning vehicle control system of claim 1, wherein the one or more vehicle control commands are captured by a camera configured to monitor the position of driving controls of the vehicle.

11. The self-learning vehicle control system of claim 1, wherein the predefined speed profile includes step and linear change commands to characterize the vehicle dynamic response over the operating envelope of the vehicle.

12. The self-learning vehicle control system of claim 1, wherein the one or more sequences of states comprise at least one of a sequence of velocities or a sequence of accelerations.

13. The self-learning vehicle control system of claim 1, wherein the one or more vehicle status sensors includes capture of vehicle kinematic data including one or more of grade, curvature, and elevation.

14. An automatic speed control system, the speed control system comprising:

a processor configured to execute a set of instructions comprising:

a vehicle module; and

a speed control module, the speed control module communicably coupled with the vehicle module;

wherein the speed control module is configured to generate vehicle control commands in response to receipt of one or more of a vehicle status attribute, a speed profile, or a guideway attribute and the vehicle module is configured to receive the vehicle control commands and generate vehicle status attributes, the speed control module is configured to receive the generated vehicle status attributes.

15. The automatic speed control system of claim 14, wherein the speed control module is configured to meet one or more training objectives.

16. The automatic speed control system of claim 15, wherein the one or more training objectives comprise one or more of:

minimum driving time;

minimum overspeed;

minimum passenger discomfort;

minimum stop overshoot;

minimum energy; or

minimum switching from motoring to braking.

17. The automatic speed control system of claim 14, wherein the speed control module is limited by one or more constraints.

18. The automatic speed control system of claim 17, wherein the one or more constraints comprise one or more of:

a minimum speed limit;

a maximum speed limit;

a minimum arrival time limit;

a maximum arrival time limit;

a minimum jerk limit; or

a maximum jerk limit.

19. The automatic speed control system of claim 14, wherein the vehicle module is considered trained when the fit error on an independent validation dataset is less than a predefined tolerance.

20. The automatic speed control system of claim 14, wherein the speed control module is considered trained when the speed control module successfully completes a portfolio of validation scenarios to within a set tolerance..